SOCIAL TECHNOLOGIES IN BRAZIL AND PUBLIC POLICIES

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1. SOCIAL TECHNOLOGIES: CONCEPTS AND DEFINITIONS

The term social technologies (STs) entails different concepts and definitions, but with a common view to accommodating innovation processes thought to fight poverty and social vulnerability. STs definitions cover broad issues ranging from microcredit with solidarity/collective guarantors to interventions that aim to contest the structure of market economy in a more radical perspective. However, in all cases, the definition of ST encompass aspects of innovations in the use of technologies, interaction with the community, potential to transform social realities and to be scaled-up and replicated in other contexts.

ST first definition emerged in the 1970’s linked to the discussions around Appropriated Technology. The latter would involve technology transfer from former colonial powers to their former colonies as a means of compensation for the economic and political exploitation of the colonial past (Fraga, 2011). This approach, however, did not question the “neutrality” content of the production and transfer of these technologies, focusing only on access (Novaes & Dias, 2010). The criticism of such “neutrality” of these technologies was later made by the pioneers of STs theories in Latin America, namely, Amilcar Herrera, Oscar Varsavky and Jorge Sábado (Costa, 2013).

Other classical definitions of STs highlights that besides the use of technology to fight poverty and address social deficits, ST is based on the participation and empowerment of beneficiaries, including with their involvement as agents in the design and implementation of them (Costa, 2013). Similarly, Brava (2004) states that the defining feature of STs is the way in which the technological innovations can foster the empowerment of vulnerable groups, so these groups become agents of transformational processes in which alternative and innovative
development strategies are fostered endogenously. According to Costa (2013), another feature of the STs is the right of citizens, neighborhood organizations, solidarity economic units, NGOs, social movements and other civil society organizations to develop and appropriate/adapt technologies to the benefit of the society. By this same token Dagnino (2010; 2012) states that STs are characterized by its capacity to “re-design” the usual technologies for its use in alternative contexts.

From a more critical perspective, one could argue that STs are solutions elaborated by vulnerable communities/groups using as starting point their own perception of their problems and needs and having as inputs their resources and knowledge. ST are produced and reproduced with the aim of not generating the alienation of the agents involved. Thus, the production techniques are shared among producers, bringing together production and the producer’s interests and stimulating community’s creativity. STs in this approach is a production and reproduction process with a focus on community associations and their ways of expression and organization.

Other definitions of STs such as the one of the Social Technology Institute (2004) conceptualizes STs as a manner to legitimize the role of NGOs in adapting Information and Communication Technological (ICT) systems, allowing them to have access to its resources and put it to use in their area of activity. The Banco do Brasil (FBB) foundation, an important stakeholder in the promotion of ST in Brazil, highlights the singularity of the STs for bringing together popular knowledge, social organization, and the technical-scientific knowledge in the generation of effective solutions that are replicable at large scale.

2. OBJECTIVES OF THE NOTE AND MAIN STS STAKEHOLDERS IN BRAZIL

This note aims to document STs that have strongly influenced public policies in Brazil as well as the government efforts - through adoption/adaptation and
funding - to contribute to the development and dissemination of STs. The main areas in which STs are applied (and fostered) in Brazil are adaptation to the semi-arid region and prevention of natural disasters, food security, education, energy, housing, income, water management, income generation, health, and environment.

The main stakeholders involved in the dissemination of STs are policy makers of key research and Research and Development (R&D) funding institutions, civil society organizations, researchers and academia:

- FINEP
- BNDES
- SEBRAE
- UNESCO
- Municipalities
- FNDE – PNAE
- CONAB – PAA
- NGO's such as Articulação do Semiárido Brasileiro (ASA)
- Ministry of Environment
- Ministry of Health
- Ministry of Social Development and Fight Against Hunger MDS)
- Banco do Brasil Foundation (FBB) – Social Technology Database (BTS) – and STs Award

3. **EXAMPLE OF SUCCESSFUL STS IN BRAZIL**

Two interest examples of STs in Brazil are the dissemination and knowledge awareness of the home-made ORT (oral rehydration treatment) based on the sugar and salt diluted in water (soro caseiro) to fight dehydration and reduce child mortality and the construction of pre-made cisterns that are built by communities in the semi-arid region of Brazil to attenuate the effects of the lean/dry season. Thanks to a large State network that support and promote these STs, many of them have influenced public policies or became a public
policy themselves. The methodology of construction of pre-made cisterns in the semi-arid region is a good example of this process. For more than 10 years, ASA (Brazilian Semiarid Adaptation Movement) – a consortium of civil society organizations - has been receiving Federal government (through the Ministry of Social Development) support to disseminate this methodology in order to minimize the worst effect of the crisis. Other institutions such as the Banco do Brasil Foundation and Petrobrás (State oil company) also support the dissemination of this technology. In addition to access to pre-paid cisterns, there is also another innovation called P1+2 (or “second water”) in which households in the semiarid that already have the cisterns for drinking and cooking, receive technical assistance to build reservoirs using STs to harvest and store water to be used in vegetable gardens and to be given to small livestock. Also in the semiarid region, the Agua Doce programme promotes the desalination of water for fish farming, using plants that absorb the salt and later can be used to feed goats – the most common livestock for smallholder farmers in the region.

Other examples of STs that became public policies can be found in the strategies to support family farmers and to improve food security. Some examples are the PAIS – Sustainable and Integrated Agriculture Production supported by SEBRAE; the Food Acquisition Programme (PAA), which has been successively modified to respond to the demand of the family farmer's social movement, including the minimum of 30 per cent of purchase from family farmers of the total resources of the school feeding programme.

4. THE INSTITUTIONALIZATION OF SOCIAL TECHNOLOGIES IN BRAZIL: BANCO DO BRASIL FOUNDATION AGENDA

The Bank of Brazil Foundation (FBB) is an important stakeholder in the identification, funding and exchange of experiences and best practices in promoting STs. Since its creation in 1985, the FBB works in the field of science and technology supporting social and research projects. In 2001, it created the Database of Social Technologies (Banco de Tecnologias Sociais - BTS) with a
focus on investment, funding and dissemination of STs already implemented/tested which were found to be replicable and effective in addressing social problems and challenges. To assist in this process, it was created the Bank of Brazil Foundation Award for Social Technology, in partnership with Petrobras, BNDES, KPMG, independent auditors and UNESCO Brazil. A by-product of this award is a database publicly available that lists sustainable and replicable STs. In its seven editions the Bank of Brazil Foundation Award for Social Technology has invested over R$ 3 million in the improvement of more than 500 different initiatives listed in the Social Technology Database (Jesus and Costa, 2013). In its last edition (2013), it was received 1,011 applications, and 192 were included in the database. The awards is comprised of five distinct categories: 1) Traditional Communities, Family Farmers and Settlers of Agrarian Reform; 2) Youth; 3) Women; 4) Public Managers; 5) Education and research Institutions and Universities.

Since 2003, the FBB, in line with the Zero Hunger Program of the federal government, began working with the replication of STs aimed at generating employment and income in communities with low Human Development Index (HDI).

5. THE INSTITUTIONALIZATION OF SOCIAL TECHNOLOGIES IN BRAZIL: FINEP, BNDES AND IPEA IN THE FUNDING OF STS.

FINEP is a funding institution for Research and Development in Brazil, which recently joined forces with the BNDES and the IPEA to strengthen their agenda on STs. The first two participating institutions provide funds while the IPEA elaborates ratings/rankings, and undertake competitiveness and sustainability studies.

Eight out of the 18 programmes and funding lines of FINEP, are directly related to the dissemination of STs, while the remaining lines are indirectly related. Many of these programmes make it possible for smaller firms to participate in
R&D project as "business partners". There are also funds for Scientific and Technological Institutions (ICTs).

**BOX 1 – FINEP Programmes and funding lines and its capacity to support Social Technologies.**

<table>
<thead>
<tr>
<th>Programs with greater capacity to contribute and promote STs</th>
<th>Programmes with indirect capacity to contribute and promote STs</th>
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<tbody>
<tr>
<td>1 Inovacred</td>
<td>Inova Aerodefesa</td>
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<tr>
<td>2 Innovation in Assistive Technology</td>
<td>Inova Agро</td>
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<tr>
<td>3 Inova Energy</td>
<td>Reimbursement Funding</td>
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<tr>
<td>4 Inova Health</td>
<td>Inova Petro</td>
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<td>5 Inova Sustentability</td>
<td>Inovar</td>
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<td>6 Inova telecommunications</td>
<td>Direct Investment in Innovating Firms</td>
</tr>
<tr>
<td>7 SIBRATEC</td>
<td>PAISS</td>
</tr>
<tr>
<td>8 TECNOVA</td>
<td>PAISS Agriculture</td>
</tr>
<tr>
<td>9</td>
<td>Economic Subvention</td>
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<tr>
<td>10</td>
<td>International Cooperation</td>
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Source: author’s elaboration using FINEP information.

The Inovacred programme, for example, is a fund for investment in innovation that works in a decentralized fashion based on financial agents spread across the federal units. Each financial institution offers up to R$ 80 million to support innovating firms. The values of the funded projects must be equal to or greater than R$ 150,000 and less than or equal to R$ 2 million for small to medium scale firms (based on gross revenue) and equal to or less than R$ 10 million for larger firms. This initiative offers funds with interest rate of 3% per year. For firms in the North and Northeast, the final cost of operations is even lower (TJLP rate less 1.5% per year) and up to 96 months of grace time.

As for the Innovation in Assistive Technology programme, whose budget for 2014 is R$ 150 million, funding is provided for amounts between R$ 1 million to R$ 20 million, with interest rate of up to 4% per year, grace period of 36 months and payment differed in 84 months. These are one of best financing conditions precisely because of social relevance of the technology covered by
this programme, with promotes the development of technology that will help the well-being of people living with disabilities.

The Inova Energy programme, in turn, can accommodate STs more directly in its line dedicated to sustainable and hybrid smart grids, in which smaller initiatives may participate by partnering with larger companies. In this programme line, FINEP funds up to 90% of project value and grants grace time of up to 36 months. For 2013-14 there has been an increase in capital in the amount of R$ 200 million, which will provide an extra credit of R$ 1 billion.

In the case of the Inova Health Programme, private and state enterprises can apply for funding. The funding line N.3 is the more directly related to STs as it focus on Telehealth and Telemedicine - particularly in relation to projects that meet the demand of the Brazil Telehealth Network Programme, managed by the Ministry of Health. The Inova Health Programme provides funds totaling R$ 3.6 billion by December 2017. The thematic line n. 5 of the Inova Telecommunications is also related to the Inova Health as it focuses on the development of technological solutions dedicated to telehealth.

The Inova Sustainability programme offers four thematic lines with large capacity to support STs: 1) Sustainable production; 2) Recovery of Brazilian Biomes and Forest-Based Sustainable Productive Activities Fostering, 3) Environmental Sanitation, 4) Environmental Monitoring and prevention of natural disasters. Initiatives in this area have 4 instruments provided by FINEP and 11 others provided by BNDES.

SIBRATEC (Brazilian System of Technology) is a programme that is comprised of three components: Networks of Centres of Innovation (with a focus on Scientific and Technological Institutions- ICTs); Networks Technology Services (for more traditional firms) and the Networks of Technological Extension (suppliers of technical assistance in the innovation process).
Finally, the TECNOVA programme promotes economic subsidy for micro and small firms. The value of the grant to be awarded to companies with FINEP resources varies between R$ 120,000 and R$ 400,000.

In addition to the programmes listed above, there are also other FINEP initiatives and of its partners to intensify the dissemination of STs. As a result of the partnership between FINEP and Ministry of Science, Technology and Innovation (MCTI) in the context of Rio +20 (2012), the Sustainable Brazil programme was created, offering R$ 2 billion for the development of products, processes and innovative services linked to the concept of sustainability. Among the topics covered are Smart Grids, renewable/biofuels Energy, Energy Efficiency, Mobility and sustainable urban transport, reduction of the effects of climate change and pollution, sustainable production (clean technologies, ecodesign) waste recycling and environmental sanitation, construction and sustainable urban infrastructure, social technologies, biodiversity and biomes, sociobiodiversity networks, electric vehicles and/or hybrids.

For the period 2013-14 it was created a new programme named Inova Empresa, whose selection criteria are based on 3 ratings prepared respectively by the IPEA, the Serasa (credit rating bureau) and technology experts. These ratings are sets of indicators that support and make it more transparent the selection of projects to be supported by FINEP programmes. The rating prepared by IPEA, made up of 86 indicators, was presented at the Seminar “Social Technologies and the new Inova Empresa programme.” During that event, the President of the IPEA and Minister of SAE, Dr. Marcelo Neri, said that the challenge for IPEA and FINEP is to collaborate to disseminate social technologies in the country in the areas of education, health and urban mobility, and cited as an example of the microcredit initiatives in the Brazilian Northeastern region, whose experience he considers social technologies at a large scale.
The rating prepared by IPEA includes five dimensions: economic (net revenue and number of employees), sectoral (technological intensity and R & D investment of the sector), spending on innovation activities (continuous and occasional R&D), human resources allocated in innovation activities expenditures in innovation activities (personnel employed in R & D) and results of innovation activities (percentage of revenue from new products, product and process innovations).

Also as part of the Inova Empresa programme, the FINEP Innovation Award was created, which has a specific category for STs. In 2013 the Technology Foundation of Acre (FUNTAC) was the winner. This Foundation has been producing for five years, male condoms using latex native from the Amazon rainforest. Its production is distributed to all the states of North region besides the states of Mato Grosso, Mato Grosso do Sul and the Federal District. About R$30 million has been invested in the project and in the factory, which produces up to 100 million condoms a year. The project strengthens the productive network of rubber, boosts the economy of the forest, and generates employment and income for the rubber tree tappers.

6. SOCIAL TECHNOLOGIES AND THE SINGLE REGISTRY OF TARGETED SOCIAL PROGRAMMES

A very important ST in Brazil is the Single Registry (CadÚnico): a database with socio-economic information of individuals and families living in poverty and vulnerability, which is the main tool for the design and implementation of public policies for that population at all levels, namely, Federal, State and municipality government. As pointed out by Renato Veloso:

"[...]the Single Registry is a representative map of the poorest and most vulnerable families in Brazil, with a broad potential to be used by various social protection programmes [...] It serves as an important planning tool for public policies aimed at low-
income families which allows the creation of indicators that reflect the various dimensions of poverty and vulnerability, through the identification and characterization of the socially vulnerable segments of the population." (Veloso, 2012).

The information compiled in the Single Registry includes both data on the household (family composition, address, household characteristics, access to water, sanitation, electricity, monthly expenses and access to Social Programmes) and data about each of the components of family (such as civil documentation, educational attainment, occupation status and income).

More than a tool for compiling this information, the Single Registry is characterized as STs because of its strategy for community and local government involvement in the collection and use of this data. The information is collected by municipalities, which receive financial incentives from the central government to perform its functions and improve the quality of the registry and the monitoring of the conditionalities of the Bolsa Familia programme. Once collected, the information is processed by MDS and constantly publicized through the Social Information Matrix (MIS) – an online database - and on a series of periodic publications based on specific indicators. Moreover, the department responsible for the Bolsa Familia implementation (SENARC) at the MDS provides frequent training for municipal officers, and learning and exchange sharing of best practices in the implementation of the Single Registry, which increases municipality capacity to plan and implement public policies aimed at fighting poverty and inequality.

According to Smith et al. (2009), one of the main characteristics of the Single Registry is precisely how its use of Information & Communication Technology brings together the a common database to be used by several social protection programmes. According to the authors, this process was gradually built over the years, and its reach is largely associated with the unification and expansion of the Bolsa Familia programme. According to Soares and Sátyro (2009), before the
unification of CCT programmes in 2003 there was no way to strengthen the Single Registry because each CCT programme was managed by a different executing agency, through different information management systems, and without much coordination between them. Through the merge of various CCTs into the Bolsa Familia in 2003 it was possible to effectively unify and expand the database of poor and vulnerable population in the country.

In any case, it must be acknowledged that although the Single Registry was expanded as a result of the Bolsa Familia programme, and even though the Single Registry is essential for the functioning of the Bolsa Familia, its importance goes beyond the BF itself. The Single Registry is also a tool for the targeting of the following federal programs: Bolsa Verde, Minha Casa Minha Vida, Social Tariff for Electricity, Popular telephone, Programme for the Eradication of Child Labor (PETI), Senior Citizen Card, Water for All Programme, PROJOVEM, special pension benefit for "housewives", Emergency Assistance for drought. Additionally, the Single Registry is also used to target several state and local municipal programmes such as the Bolsa Carioca (Rio de Janeiro City complementary programme to BF). Moreover, Single Registry not only includes beneficiaries of social programmes, but also aims to gather information on people in vulnerable situations regardless of whether or not being eligible for a specific social protection programme.

In 2005 with the improvement of the Single Registry management information system technologies, this ST tool went through a cleaning process that informed the expansion of the Bolsa Familia programme. In 2008, a new enhancement took place with the inclusion of specific information for indigenous communities, maroons and homeless.

In 2009, the version 7.0 of the Single Registry was launched in an attempt to make it more efficient. Produced using a free software, the version 7.0 supports data entry and data updating online (in real time), thus eliminating the need for
data extraction and transmission. Additionally, the new version has initiated a national effort to empower the municipal agents. This task was undertaken by a team of over 20,000 trainers, and resulted in the training of at least one agent per municipality that had already implemented version 7.0. It is worth noting, however, that not all municipalities currently operate with all the features of the version 7.0 since it requires computers with good stable and fast connection to internet.

Among the innovations brought about by version 7.0 it is worth mentioning the strengthening of the verification mechanisms of the unicity of the individuals in the registry. This is possible because the information goes directly and immediately to the national database which can be accessed at any time by other municipalities. The new version also allows municipal managers to identify in the system the families and individuals registered by other municipalities, to change the person responsible for family in the system (beneficiary who receive the transfer), cope with families moving across municipalities without losing their benefits or missing their information in the system, including individuals who do not have a birth certificate in the Single Registry (without assigning an ID number, NIS, and without being considered in the calculation of the per capita family income.

The Single Registry has been so successful that today it is one of the largest source of demand for international cooperation, particularly, for countries that are developing cash transfer programmes. The achievements of Brazil’s social protection and food security policies has led to a major interest in sharing and adapting these experiences to other contexts. Similar interest for cooperation has been expressed for the dissemination for the pre-made cisterns and of the food acquisition programme (PAA) also discussed in this note.